

# Frailty

## Identifying elderly patients at high risk of poor outcomes

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### Abstract

**Objective** To help family physicians better recognize frailty and its implications for managing elderly patients.

**Sources of information** PubMed-MEDLINE was searched from 1990 to 2013. The search was restricted to English-language articles using the following groups of MeSH headings and key words: *frail elderly, frail, frailty; aged, geriatrics, geriatric assessment, health services for the aged; and primary health care, community health services, and family practice.*

**Main message** Frailty is common, particularly in elderly persons with complex chronic conditions such as heart failure and chronic obstructive pulmonary disease. Emerging evidence demonstrates the value of frailty as a predictor of adverse outcomes in older persons. While there is currently a lack of consensus as to how best to assess and diagnose frailty in primary care practice, individual markers of frailty such as low gait speed offer a promising feasible means of screening for frailty. Identification of frailty in primary care might provide an opportunity to delay the progression of frailty through proactive interventions such as exercise, and awareness of frailty can guide appropriate counseling and anticipatory preventive measures for patients when considering medical interventions. Recognition of frailty might also help identify and optimize the management of coexisting conditions that might contribute to or be affected by frailty. Further research should be directed at identifying feasible and effective ways to appropriately assess and manage these vulnerable patients at the primary care level.

#### EDITOR'S KEY POINTS

- Because frailty in elderly persons is a predictor of adverse outcomes and mortality, it is important to be aware of frailty when discussing risks and benefits of proposed medical or surgical interventions with patients.
- While there is currently a lack of consensus as to how best to assess and diagnose frailty in primary care, individual markers of frailty such as low gait speed might be a means of screening for frailty.
- Identification of frailty in primary care practice might offer the opportunity to minimize or reverse the development of frailty through targeted proactive interventions guided by a comprehensive geriatric assessment, and adverse outcomes might be reduced through appropriate risk counseling when considering invasive therapeutic procedures. Recognition of frailty might also assist in identifying and optimizing the management of coexisting conditions that might contribute to or be affected by frailty.



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**Conclusion** Despite its importance, little attention has been given to the concept of frailty in family medicine. Frailty is easily overlooked because its manifestations can be subtle, slowly progressive, and thus dismissed as normal aging; and physician training has been focused on specific medical diseases rather than overall vulnerability. For primary care physicians, recognition of frailty might help them provide appropriate counseling to patients and family members about the risks of medical interventions.

### Case description

Edward is a 90-year-old retired professor who is slowing down. Previously physically active, he now walks much more slowly. He has had several recent falls. Because of unsteadiness and fear of falling, he uses a walker or cane to walk short distances. His reduced appetite has resulted in a 9-kg unintentional weight loss over 2 years. He is cognitively intact. He denies experiencing any severe discomfort, but says he has "lost strength." He has had urinary incontinence for several years, attributed to radiotherapy for prostate cancer in 1996. His medical history includes a stroke in 2003 involving mild left-sided hemiparesis, rheumatoid arthritis in remission, hypertension, and hyperlipidemia. He lives independently with his elderly wife in a 2-storey house. Edward takes the following medications: 20 mg of simvastatin once daily, 5 mg of ramipril once daily, 75 mg of clopidogrel once daily, and vitamin D.

Edward visits his family physician regarding worsening urinary incontinence and falls. His gait is notably slow with no specific abnormality of gait pattern. His physical examination does not reveal clinically significant findings apart from generally reduced muscle mass and noticeable weight loss. Magnetic resonance imaging reveals central lumbar spinal stenosis. Results of a pelvic ultrasound show urinary bladder volume of 131 mL before voiding, with 56% retention after voiding. Cystoscopy is performed under spinal anesthesia and he is sent home with a urinary catheter. During the following 2 days, Edward develops confusion and experiences repeated falls. He now needs assistance from 2 people to transfer and requires assistance with feeding and toileting. His wife is no longer able to manage his care needs. Edward is sent to the emergency department where he is found to have suffered a myocardial infarction, developed hyponatremia, and become delirious. He is admitted to hospital where 2.5 mg of bisoprolol once daily is initiated, fluids and electrolytes are managed, and the extent of treatment is clarified.

This case demonstrates the effects of frailty, a state of increased vulnerability to poor outcomes with reduced ability to recover from an acute stressor. For this frail senior, a minor medical procedure has resulted in serious adverse outcomes. Could the higher risk of poor outcomes have been anticipated?

### Sources of information

PubMed-MEDLINE was searched from 1990 to 2013. The search was restricted to English-language articles using the following groups of MeSH headings and key words: *frail elderly*, *frail*, *frailty*; *aged*, *geriatrics*, *geriatric assessment*, *health services for the aged*; and *primary health care*, *community health services*, and *family practice*. Articles cited in papers were also reviewed and referenced when appropriate.

### Main message

**Frailty.** *Frailty* has been defined as a state of increased vulnerability from age-associated decline in reserve and function resulting in reduced ability to cope with everyday or acute stressors.<sup>1,2</sup> A person who is frail is at higher risk of adverse health outcomes.<sup>3</sup> Frailty has been associated with functional impairment, hospitalizations, and mortality,<sup>4-6</sup> with the risk of individual mortality being better predicted by frailty than by chronological age.<sup>7</sup> Frailty has been shown to be a strong and independent predictor of emergency department visits and hospitalizations,<sup>8</sup> hospital readmissions,<sup>9</sup> and in-hospital mortality.<sup>10</sup> In surgery, preoperative frailty has been associated with greater risk of postoperative complications and mortality, institutional discharge, and reduced survival.<sup>11-14</sup>

Recent studies associate frailty with increased risk of fractures, recurrent falls, and disability.<sup>15</sup>

Currently, frailty is recognized as a multidimensional concept with dynamic interrelated factors in the physical, psychological, social, and environmental domains that affect the physiologic equilibrium of the person.<sup>16-18</sup> Frailty is often associated with disability and comorbidity, but neither is essential for a diagnosis of frailty.<sup>5</sup> There appears to be a continuum between frail and not frail, and the level of frailty might vary over time; however, transitions from frail to not frail are unlikely.<sup>19,20</sup> Frailty is more common in older persons, and most frail persons have at least 1 chronic condition,<sup>4</sup> with a higher number of chronic conditions associated with increased frailty risk. However, most persons with chronic diseases are not frail, and frailty is not exclusive to older persons. The mechanisms linking frailty to aging and chronic disease remain unclear.<sup>2</sup>

**Prevalence.** Although the prevalence of frailty varies greatly depending on the method of measurement,<sup>6,21</sup> overall it is estimated to affect 10.7% of community-dwelling persons aged 65 and older. Prevalence of frailty increases with age, affecting an estimated 15.7% of those aged 80 to 84, and 26.1% of those aged 85 and older.<sup>22</sup> Recent studies suggest a higher prevalence of frailty in persons with certain chronic conditions. For example, some degree of frailty might be present in more than half of older persons with heart failure<sup>8</sup> or chronic obstructive pulmonary disease,<sup>23</sup> and in one-fifth of persons with moderate to severe chronic kidney disease.<sup>24</sup> Cognitive impairment is present in up to 22% to 40% of persons who are identified as frail.<sup>25</sup> Older persons with urinary incontinence are 6.5 times more likely to be frail compared with those who are continent.<sup>26</sup> In women, the odds of falling are 3-fold greater in those who are frail compared with those who are not.<sup>15</sup>

**Frailty in family medicine.** Despite its importance, little attention has been given to the concept of frailty in family medicine.<sup>16,27</sup> Frailty is easily overlooked because its manifestations can be subtle and slowly progressive, and thus dismissed as normal aging; and physician training has been focused on specific medical diseases rather than overall vulnerability. For primary care physicians, recognition of frailty might help in the appropriate counseling of patients and family members when discussing risks of medical interventions. Frailty might be conceptualized as a confluence of medical and geriatric conditions and disabilities, coupled with socioeconomic circumstances, that bring some older persons closer to a threshold or tipping point for a domino effect of health destabilization.

**Indicators of frailty.** A number of conceptualizations of frailty have been proposed. Frailty has been described

as a clinical phenotype of slowed walking speed, low physical activity, unintentional weight loss, low energy, and low grip strength (weakness); presence of 3 of 5 of these criteria indicates frailty and presence of 1 or 2 criteria indicates a pre-frail state.<sup>4</sup> Alternatively, frailty has been measured in various indices by the counting of accumulated deficits across multiple domains,<sup>7</sup> or based on clinical judgment using tools such as the Canadian Study of Health and Aging Clinical Frailty Scale.<sup>28</sup> Indeed, there have been at least 27 frailty scales developed to date.<sup>29</sup> Three systematic reviews have not conclusively identified a preferred instrument for measuring frailty in the elderly.<sup>29-31</sup> There is currently lack of consensus as to how best to screen for, assess, and diagnose frailty in the busy clinical setting of primary care practice.<sup>32-34</sup>

Recent research has focused on identifying single-item assessments that might be used as indicators of frailty. Of these, reduced gait speed has been shown to be the strongest predictor of chronic disability, long-term care stays, and injurious falls,<sup>35</sup> as well as a predictor of survival.<sup>36</sup> A recent systematic review concluded that in predicting risk of adverse outcomes, use of gait speed measurements was at least as sensible as use of other composite tools and that there was now sufficient evidence to support use of gait speed as a single-item screening tool for frailty in community-dwelling older adults.<sup>37</sup> The assessment of usual walking speed for a distance of 4 m was suggested as a highly reliable instrument, with 0.8 m per second (more than 5 seconds to perform a 4-m course) used as a cutoff speed for risk of adverse outcomes. Use of gait speed has been supported in other recent studies.<sup>38,39</sup> Clinically, gait speed has been used before cardiac surgery to determine risk of poor outcomes postoperatively, with a 5-m gait speed of 6 seconds or greater being associated with a 2-fold increase in mortality or major morbidity.<sup>40</sup>

**Management.** Once frailty has been identified, management involves identifying and addressing conditions that might underlie frailty and mitigating stressors that might precipitate adverse outcomes. A comprehensive geriatric assessment (CGA)<sup>41</sup> is recommended to evaluate physical, cognitive, affective, social, environmental, and spiritual factors that influence health, and linking these to a plan of management. The benefits of CGA and community-based multifactorial interventions for the frail elderly have been demonstrated.<sup>42,43</sup> Despite its importance, the time required to conduct CGA might present a challenge for primary care physicians owing to considerable time pressures within the current structure of family practice and inadequate reimbursement models.<sup>44,45</sup> On the other hand, referral of all frail seniors to specialists for CGA might not be a feasible or sustainable solution given the critical shortage of geriatricians in Canada.<sup>46</sup> A redesign of care

processes is needed to allow primary care practices to leverage the multidisciplinary health care providers needed to manage a larger proportion of frail seniors at moderate risk, and to target those at highest risk for integrated geriatric specialist comanagement.<sup>47</sup>

Management of frail seniors should include the following: medication review<sup>48,49</sup>; more frequent outpatient visits with the primary care physician<sup>9</sup>; exercise interventions for strength, endurance, and balance training<sup>50,51</sup>; informed discussions about risks associated with surgical procedures<sup>52</sup>; and advance care planning. Because frailty is a predictor of survival,<sup>7</sup> identification of frailty might help to determine the appropriateness of preventive interventions that require years for benefit, helping physicians to individualize goals of care for their geriatric patients.

**What is needed.** There is emerging evidence that risks associated with frailty might be improved with interventions such as comprehensive assessment<sup>42,43</sup> and exercise training. Therapeutic exercise has been shown to increase gait speed and improve performance in activities of daily living<sup>50,51,53</sup>; however, the degree of benefit in some studies has been modest.<sup>54,55</sup> Further research should be directed at determining the extent to which frailty can be reversed or postponed, and the boundary between tractable and intractable stages in the progression of frailty. Frailty in seniors has been associated with lower nutritional status,<sup>56,57</sup> and further studies are required to demonstrate the effectiveness of specific nutritional interventions.<sup>58</sup> Research should also be directed at assessing potential benefits of providing intensive preoperative and postoperative care programs for seniors identified as frail who require surgical interventions in hospital, perhaps incorporating elements of the Hospital Elder Life Program, which has been shown to reduce the development of delirium and functional decline in hospitalized older adults.<sup>59-61</sup>

With the rapidly aging Canadian population, primary care physicians will be increasingly required to identify and manage frail seniors at risk and their associated complex chronic conditions with judicious use of limited available specialist resources. To identify and manage these vulnerable seniors at the primary care level, we need to develop effective and feasible models that can be implemented in the family practice setting, as well as models of reimbursement to adequately support these processes. Successful programs will likely require a redesign of primary care processes in which patients with chronic conditions can be stratified according to risk of poor outcomes and intensity of management escalated according to patient needs.<sup>62</sup> An awareness of the frailty state might assist in this stratification of risk.


In the case described in this article, identification of frailty was possible. Once identified, considerations

in this frail senior might have included exercise interventions to improve balance and strength, optimized management of coexisting chronic diseases, and, most important, a frank discussion of the risk of poor postoperative outcomes and possible alternatives to surgical management. If surgical intervention had been chosen, delirium prevention interventions<sup>63</sup> might have been implemented in-hospital, as well as home-care support and close follow-up in primary care after discharge.

## Case resolution

In hospital, Edward's delirium improves with correction of the hyponatremia and catheter removal. He is discharged home with support for personal care, a structured exercise program to reduce falls, and caregiver support. Family members monitor his nutritional intake. He has permanent cognitive deficits and remains functionally impaired. With the identification of frailty and potential for increased risk of poor outcomes, further invasive medical procedures have been kept to a minimum.

## Conclusion

Primary care clinicians might benefit from greater awareness of the concept of frailty. Frailty is a confluence of medical and geriatric conditions and disabilities, as well as socioeconomic circumstances, that puts many elderly patients at greater risk of health destabilization. Recognition of frailty might help primary care physicians provide appropriate counseling to patients and family members about the risks of medical interventions, and could allow for targeted interventions to reduce the risk of adverse outcomes and the opportunity to optimize management of coexisting conditions that might contribute to or be affected by frailty. 

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### Contributors

All authors contributed to the literature review and interpretation, and to preparing the manuscript for submission.

### Competing interests

None declared

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